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Application No. S2002/0038

Date of Filing 24 January 2002

Applicant EXA SA, a Swiss company of Case Postale 40,
CH-1223 Geneva, Switzerland.

Dated this 4th day of November 2002.

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020038

APPLICATION NO.

FORM NO. 1

REQUEST FOR THE GRANT OF A PATENT

PATENTS ACT, 1992

The Applicant(s) named herein hereby request(s)

the grant of patent under Part II of the Act

the grant of short-term patent under Part III of the Act

on the basis of the information furnished hereunder.

1. Applicant(s)

Name Exa SA

Address Case Postale 40, CH-1223 Geneva, Switzerland

Description/Nationality

A Swiss Company

2. Title of Invention

"Cleaning Agent and a Process for Removing Coatings"

**3. Declaration of Priority on basis of previously filed
Application(s) for same invention (Sections 25 & 26)**

Previous filing date

Country in or for
Which filed

Filing No

4. Identification of Inventor(s)

Name(s) of person(s) believed

By Applicant(s) to be the inventor(s)

Pierre ROCHAT

Address

18 Chemin de la Haute Belotte

1222 Vesenaz, Geneva

Switzerland

5. Statement of right to be granted a patent (Section 17 (2) (b))

6. Items accompanying this Request – tick as appropriate

- (i) Prescribed filing fee (EUR 60.00)
- (ii) Specification containing a description and claims
- Specification containing a description only
- Drawings referred to in description or claims
- (iii) An abstract
- (iv) Copy of previous application(s) whose priority is claimed
- (v) Translation of previous application whose priority is claimed
- (vi) Authorisation of Agent (this may be given at 8 below if this Request is signed by the Applicant(s))

7. Divisional Application(s)

The following information is applicable to the present application which is made under Section 24-

Earlier Application No:
Filing Date:

8. Agent

The following is authorised to act as agent in all proceedings connected with the obtaining of a patent to which this request relates and in relation to any patent granted

<u>Name</u>	<u>Address</u>
Naoise Gordon	Murgtroyd & Co. Regus House Harcourt Centre Harcourt Road Dublin 2

9. Address for Service (if different from that at 8)

Signed For and on behalf of the Applicant Company by

Naoise Gordon
Naoise Gordon
(Agent for the Applicant)

Date 24 January 2002



1 Cleaning Agent and a Process for Removing Coatings

2

3 The present invention relates to a process for
4 cleaning a surface of the type which employs a
5 particulate cleaning agent. The invention also
6 relates to a particulate cleaning agent and a
7 process for the production thereof.

8

9 Cleaning of the surfaces of various types of
10 equipment and structures is often desirable.

11 Numerous processes and cleaning agents are known in
12 the art. The choice of process and agent depends to
13 a great extent on the coating to be removed and on
14 the substrate. In addition, the working conditions
15 and the environmental effects of the process and
16 agent used are becoming increasingly important
17 factors when selecting an optimal cleaning
18 technique.

19

20 Sand blasting and other abrasive techniques are
21 quite applicable on hard substrates, but require

1 special arrangements to meet the specification
2 related to environment and working conditions.
3

4 Less hard and durable substrates like aluminium,
5 wood and composite materials require processes and
6 cleaning agents which do not cause mechanical or
7 chemical damage to the surface of the substrate.
8

9 An object of the present invention is to select
10 agents for cleaning, decontaminating, and removing
11 coatings, which agents are environmentally
12 acceptable and do not possess the limitations and
13 disadvantages of known agents.
14

15 A further object is the provision of an improved
16 process for cleaning substrates without
17 substantially damaging, mechanically or chemically,
18 the substrate surface.
19

20 According to the invention, there is provided a
21 process for cleaning a surface of the type which
22 employs a cleaning agent comprising a plurality of
23 particles, the process comprising the step of
24 projecting and/or accelerating the particles of the
25 cleaning agent towards, or along, the surface to the
26 cleaned such that at least some of the particles
27 roll along at least a portion of the surface,
28 wherein an angle of incidence of the particles and
29 the surface is between 0° and 60°, and wherein the
30 particles are dimensioned to effect a rolling
31 movement along the surface.
32

1 When the projected particle impacts the substrate at
2 a low angle of incidence it rolls along the surface,
3 rubbing and absorbing the coating from the surface.

4

5 Preferably, the particles are generally round. In
6 this specification the term "generally round" as
7 applied to particles should be understood to mean
8 any shape which of particle which enables the
9 particle to easily assume a rolling motion when
10 moved along a surface. As such, while the term is
11 primarily intended to refer to spherical particles,
12 it is not intended to exclude other types of
13 spheroids such as spheres having an oblong or
14 elliptical shape. Typically, the particles will
15 have an irregular surface configuration.

16

17 Ideally, the particles are relatively soft.
18 Generally, the particles have an average hardness of
19 less than 10 Mohs, typically less than 8 Mohs, and
20 preferably less than 6 Mohs. Typically, the
21 particles will have an average hardness of at least
22 1 Mohs, and preferably of at least 2 Mohs. In a
23 preferred embodiment of the invention, the particles
24 will have an average hardness of about 3 Mohs.
25 Typically, the particles have an average maximum
26 diameter of between 30 and 1000 microns.

27

28 When the process of the invention involves
29 projecting and/or accelerating the particles towards
30 the surface, various means of projection are
31 envisaged, such as for example, mechanical
32 projection (i.e. centrifugal particle acceleration),

1 pneumatic particle projection and electrostatic
2 particle projection. A mechanical particle
3 projecting device which is suitable for carrying out
4 the process of the invention is described in
5 International Patent Application No PCT/EP00/09960.

6

7 The process of the invention also encompasses manual
8 projection of the particles along the surface. In
9 this regard the particles may be rubbed along the
10 surface using a cloth, by hand, or by any other
11 means.

12

13 The invention also relates to a particulate
14 composition for use in cleaning a surface, the
15 composition comprising a multiplicity of particles,
16 each particle being generally round such that upon
17 impacting with the surface at an angle of incidence
18 of between 0° and 60°, the particle rolls along the
19 surface.

20

21 The invention also relates to the particulate
22 composition of the invention for use in the
23 manufacture of a cleaning agent, particularly an
24 industrial cleaning agent.

25

26 The invention also relates to a process for
27 producing the particulate cleaning composition and
28 cleaning agent of the invention, the particulate
29 composition and cleaning agent being obtainable by
30 precipitation or flocculation of a suitable
31 carbonate. Typically, the carbonate is calcium
32 carbonate. Alternatively, the carbonate may be

1 magnesium carbonate. In a further embodiment of the
2 invention, the particle composition comprises an
3 alkali sulphate or magnesium sulphate. In a yet
4 further embodiment of the invention, the particle
5 composition comprises a plastic, metal, polymer or
6 any other material having the required physical
7 characteristics.

8
9 Use of the process and cleaning agent of the
10 invention has the effect of removing coatings
11 without damaging the surface of the substrate. It
12 should also be possible to clean complete structures
13 and equipment having complex geometrical
14 configurations such as valves, bridges etc having
15 parts which are difficult to access with
16 conventional cleaning equipment or blasting jets.
17

18 After having cleaned the substrate according to the
19 process of the invention the cleaning agent is
20 easily removed together with the removed coating.
21 The cleaning agent itself is environmentally
22 acceptable.
23

24 The invention will be more clearly understood from
25 the following description of some embodiments
26 thereof, given by way of example only, with
27 reference to the following figures in which:
28

29 Fig 1 is an illustration of a particle of a cleaning
30 agent according to the invention; and
31
32 Fig 2 illustrates the process of the invention.

1
2 The present invention has been found to be effective
3 at removing various types of coatings from
4 substrates having hardness from that of steel to
5 wood (or even softer materials) without causing
6 damage to the subtracts surface. The cleaning agent
7 can easily be removed by flushing with water. The
8 person carrying out the cleaning process is not
9 exposed to any harm and the agent is acceptable from
10 an environmental point of view. The agent is also
11 available in desired qualities, particle size,
12 hardness etc.

13
14 Referring to the drawings, and initially to Fig 1,
15 there is illustrated a particle, indicated generally
16 by the reference numeral 1, which is used in the
17 process of the invention. The particle has a
18 generally round, and slightly irregular, shape and a
19 rough, irregular, surface configuration.

20
21 Referring to Fig 2, the process of the invention is
22 illustrated in which the particle 1 is projected
23 towards a surface 2 having a coating 3 to be
24 removed. Due to the low angle of incidence of the
25 particle 1 and the surface 2, and the generally
26 round shape of the particle 1, upon impact the
27 particle 1 rolls along the surface, rubbing the
28 surface and absorbing the coating 3 onto a surface
29 of the particle. This has the net effect of
30 removing the coating from the surface without
31 causing any damage to the surface.

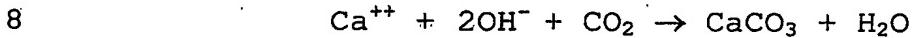
1 Example 1

2

3 Method of production of particles.

4

5 Production of insoluble particles CaCO₃ is done
6 having free Ca⁺⁺ in a liquid with a PH over 7.
7 Then we add CO₂ and obtain precipitated CaCO₃.



9 We obtain different type of particles and
10 crystallisation type by the regulation of the
11 conditions of the precipitate

12

13 Various other methods of production of particles
14 according to the invention have been investigated
15 using various types of substrates including plastic,
16 metal and polymer. Examples of these methods
17 include:

18

19 Chemical

20

21 There are numerous chemical methods for producing
22 spherical powders. Generally, chemical methods
23 result in very fine powder particle sizes. Such
24 methods include Sol Gel, chemical precipitation,
25 Reaction, reduction (hydrogen in an autoclave to
26 reduce metal salts to the metal), decomposition (eg
27 metal carbonyls) and Electrolysis.

28

29 Spray drying

30

31 This is the most widely used industrial process
32 involving particle formation and drying. It is

1 highly suited for the continuous production of dry
2 solids in either powder, granulate or agglomerate
3 form from liquid feedstocks as solutions, emulsions
4 and pumpable suspensions

5

6 Agglomeration

7

8 The most common method of agglomeration is where the
9 constituents are physically mixed together with an
10 organic binder. The solvent is then driven off and
11 the resultant material sized. The binder should be
12 burnt off during spraying. This process is used in
13 the manufacture of NiAl, AlSi or polyester powders.

14

15 Atomisation

16

17 There are a number of atomisation techniques which
18 all rely on the production of a molten pool as the
19 source. Atomisation methods include Rotating
20 Electrode, Vibrating Electrode (arc), Centrifugal
21 (from a melt) and Rapid Solidification (eg aluminium
22 ribbon). However, by far the most commonly used
23 methods are either water or gas atomisation.

24 Others

- 25 - Solid State Reduction
- 26 - Electrolysis
- 27 - Electrodeposition
- 28 - Mechanical Comminution

29

1 The invention is not limited to the embodiments
2 hereinbefore described which may be varied in both
3 construction and process step without departing from
4 the invention.

5

6

Fig. 1

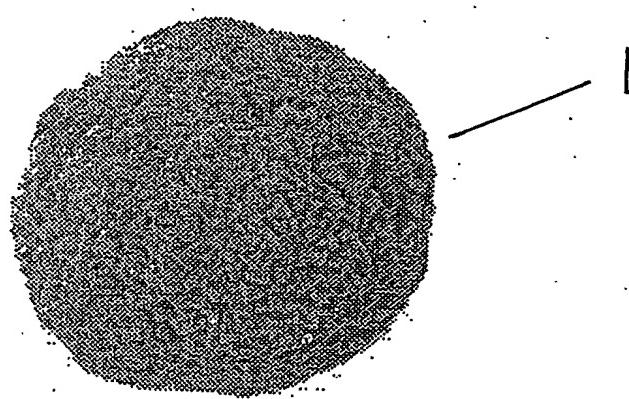
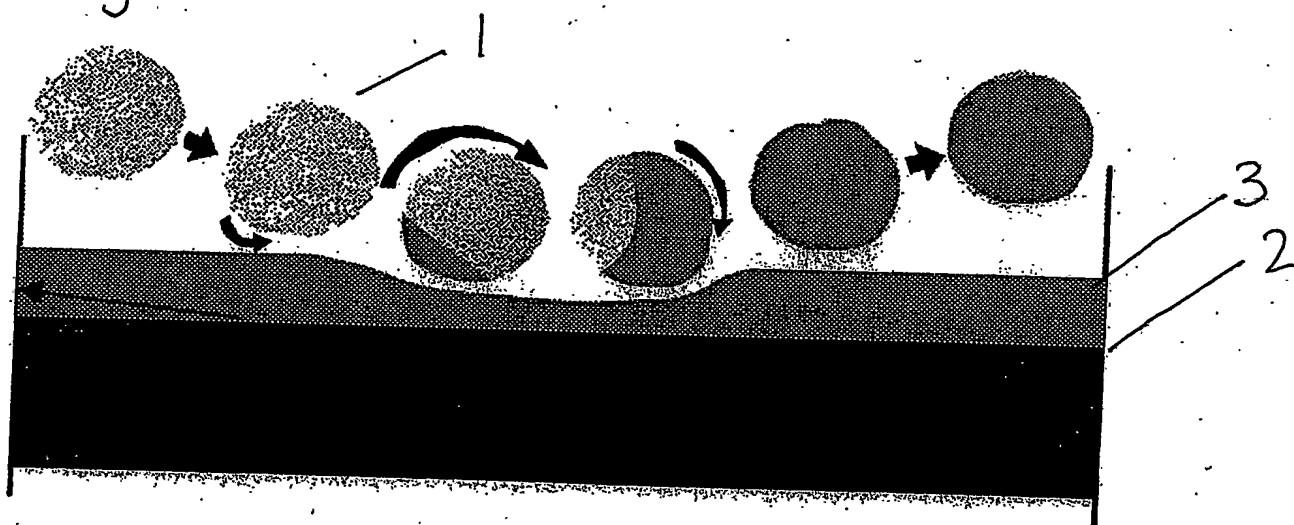


Fig. 2



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